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ABSTRACT

The effects of an oven timer as an antecedent stimulus on study behavior and concurrent completion and accuracy of reading and writing assignments were investigated for an 8-year-old first grade repeater who lacked motivation. Following baseline observations during which the teacher recorded study behavior and collected assignments with no comments, the teacher set an oven timer to cue the child. S's attending behavior increased from an average 48 percent of the time to an average 82 percent of the time; average percent correct increased from 52 percent to 77 percent; and average percent complete from 69 percent to 89 percent. A fading procedure was used to gradually remove the timer while maintaining the child's increased performance. The teacher was able to carry out the procedure while attending to 21 other students. (Author/LS)

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An Evaluation of the Effects of an Oven Timer on Study Behavior and Concurrent Completion and Accuracy of Assignments for a First Grade Repeater: A Case Study

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Abstract

The effects of an oven timer as an antecedent stimulus on study behavior and concurrent completion and accuracy of reading and writing assignments were investigated. Following baseline observations during which the teacher recorded study behavior and collected assignments with no comment, the teacher set an oven timer to cue the child. This resulted in a marked increase in study behavior, completion and accuracy of assignments. When the timer was withdrawn, all three behaviors decreased and then increased once the timer was reinstated. Following this verification of the effects of the timer, the teacher used a fading procedure to gradually remove the timer while maintaining the child's increased performance.

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by

Elizabeth D. Riegelman, Anne Browne, Martha F. Knight, and Ann Egner

Teachers are often faced with a pupil who does not respond properly to academic materials indicating that remediation techniques are needed. Many teachers have arranged subsequent events as reinforcers on a contingent basis in order to improve the academic performance of their pupils. These events are scheduled to occur only if the pupil behaves in a certain way, and may serve to increase or decrease behavior. Sometimes tangible objects are used as discriminative stimuli in arranging subsequent events, such as tokens or signaling devices.

Other teachers have found the manipulation of antecedent events to be a successful way to increase academic performance. These antecedent events occur before the student responds and may take many forms. Lovitt and Curtiss (1968) found that a student's correct answer rate in math increased as a result of his verbalizing the problems before making a written response. In a later study (Lovitt and Curtiss, 1969), the authors assessed the effects of the contingency manager (teacher or pupil) on a pupil's academic response rate.

They found that the contingency manager who described the contingencies before the performance was an important variable in the pupil's gain in performance. Lovitt and Smith (1972) studied the effects of antecedent instructions on a pupil's verbal behavior, finding that the pupil's verbal responses were directly affected by oral instructions. In another recent study (Smith, Lovitt, and Kidder, 1972) teaching aides such as paper clips, an abacus, and cuisinare rods were used as antecedent stimuli to increase subtraction proficiency in children.

Dawson and Knight (1972) had used a kitchen timer in a tutorial setting to increase accuracy rate for a second grade boy. The purpose of this investigation was to assess the effects of a kitchen timer on a study behavior and concurrent completion and accuracy of assignments for a boy in a large class setting.

Method

Student and setting. Ronnie was an eight year old boy who was attending his second year in a first grade class in an urban Vermont school. He was referred for special education services because he was "difficult to motivate, easily distracted and negative about school." His teacher reported that although he appeared able to do his work, he rarely finished his assignments in the allotted time. When presented with paper and pencil tasks, he would either avoid them completely or become rebellious when requested to complete the task. He began the year at the 1.5 reading level. Because of his poor completion behavior, he was below grade level in reading and math at the end of his first grade school year. The teacher was concerned that if the student continued this pattern of behavior he would have to repeat the first grade for the third year.

The classroom of 22 pupils was arranged with desks in clusters in the middle of the room, and special interest areas around the outside. Observers sat in one corner of the classroom in a position ensuring a good view of the student and the teacher.

Data was collected during the daily reading period, between 8:40 a.m. and 9:25 a.m., from January through April.

Behaviors measured. 1) Attending behavior was defined as "being seated at the desk with face oriented toward work materials on the desk." It was recorded on a time sample measurement at the end of

a five minute interval for ten samples during the 45 minute period. At 8:40 the teacher observed the student. If he was attending, she marked a "+" on the data sheet; if he was not attending, she marked a "0" on the data sheet. She recorded attending behavior in this manner throughout the ten intervals. After the observation period, the teacher computed a percentage of attending behavior by multiplying the number of "+'s" by ten. These percentage points were plotted on a graph.

At least once during each experimental condition, reliability of measurement was obtained by a second observer recording the same behaviors concurrently with the teacher. A percentage of agreement was calculated by dividing the agreements by the sum of agreements and disagreements and multiplying by 100. On four occasions a percentage of agreement of 100% was obtained.

2) Assignment completion was also measured. A penmanship assignment was completed when the material written by the teacher on the chalkboard was copied by the student. Four lines were assigned daily. To be counted correct, each line must had a) letters correctly formed, b) letters correctly spaced, and c) letters on the line as appropriate, not above or below. A reading and workbook assignment was completed independently using the Palo Alto Reading Series (Harcourt, Brace and World, 1968), Books 5 and 6. These were on a first grade reading level. A typical assignment consisted of three pages of reading and two workbook pages. The assignment was considered complete when all items on the workbook pages had been completed. A percent complete was computed by dividing the number complete by the number assigned and multiplying by 100.

Reliability was obtained for completion once in each condition, with 100% agreement between teacher and observer.

3) Accuracy was measured when the work was completed. The teacher collected the assignments, including the writing paper and the workbook pages. Papers were corrected and a percent correct was computed by dividing the number correct by the total problems assigned and multiplying by 100. A second observer rescored the papers with 100% reliability.

Experimental phases. An ABAB research design was used to evaluate the control of the experimental condition.

Baseline$_1$. At the beginning of the 45 minute reading period, the student obtained his work folder and began to work at his desk. The work folder contained the student's assignment for the day, his workbook and his reading book. The pupils were instructed to first complete the penmanship assignment on the board. When that was completed, they were instructed to do their reading and workbook assignments in their folders. The students raised their hands if they needed the teacher's assistance. The teacher responded only to those who raised their hands.

As soon as the students completed their assignments, they raised their hands, and the teacher corrected their papers. When the assignments were completed correctly, the pupils were allowed to choose from four language arts activities. These included creative writing, dictionary skills, scholastic books, and puzzles. If a student completed four of these activities, he was reinforced with free time for the rest of the week. The students gathered the materials needed and returned to their seats to work on their chosen activity independently. At the

end of the period, their activity work was handed in to the teacher and materials were put away. Since Ronnie never completed his work, he never was eligible to participate in the projects activities and never signaled the teacher for her attention for completion. Thus, for Ronnie, specific time limits were set for each assignment: a) writing assignment, 10 minutes and b) reading and workbook, 35 minutes. At the end of 10 minutes, the teacher collected Ronnie's writing papers with no comment. At the end of 35 minutes, she collected his reading textbook and workbook with no comment.

Timer condition$_1$. During the timer condition, baseline conditions were continued with the addition of a kitchen timer.

A standard kitchen timer was placed on the pupil's desk and was set at the beginning of the period for ten minutes. The pupil was instructed that the timer was set for ten minutes, and at the end of the ten minutes, his writing assignment should be completed.

At the end of the ten minutes, the writing assignment was collected as during baseline. The timer was then set for 35 minutes. The pupil was told that he had 35 minutes to complete his reading and workbook assignments. At the end of this 35 minute period, the pupil's work was collected and corrected as described during the baseline condition.

These procedures were repeated, Baseline$_2$ and Timer condition$_2$, in order to obtain a scientific verification of the control of the timer.

Fading procedure. 1) The oventimer was removed for the writing assignment. At the beginning of the period, the teacher said, "Look at the clock, Ronnie. Your writing assignment should be finished in

ten minutes at ___ o'clock. After the ten minutes, the writing assignment was taken away and the timer was placed on the desk and set for 35 minutes. The student was reminded that his silent reading and workbook assignments should be finished at ___ o'clock (in 35 minutes). This procedure was carried out for two sessions.

2) During this second phase, the timer was not used at all. At the beginning of the period, the teacher said to the student, 'Look at the clock, Ronnie. Your writing assignment should be finished in ten minutes, at ___ o'clock. After ten minutes the writing assignment was taken away, and the student was instructed that his silent reading and workbook assignments should be completed in 35 minutes, by ___ o'clock. This procedure was carried out for one session.

3) In this phase, the teacher did not prompt Ronnie about the time. The writing, reading and workbook assignments were all to be finished during the 45 minute period. Assignments were collected when completed or at the end of the 45 minute period.

Results

Figure 1 depicts the daily measures of attending, completion, and accuracy for each condition. For all three behaviors, daily measures increased consistently during the timer conditions compared with measures obtained during baseline conditions.

Figure 1 goes about here

During Baseline$_1$ the pupil attended an average of 48% of the time. His percent correct averaged 52% and 69% complete.

During Timer condition$_1$, the pupil's attending increased to an average of 82%, the percent correct to an average of 77% and the percent complete to an average of 89%.

During the return to baseline, attending decreased to an average of 30%, percent correct to an average of 45%, and percent complete to an average of 47%.

Following a reinstatement of the timer condition, attending again increased to an average of 81%, percent correct to an average of 83%, and percent complete to an average of 89%.

During the fading procedures, the attending averaged 75%, percent correct averaged 84%, and percent complete averaged 91%.

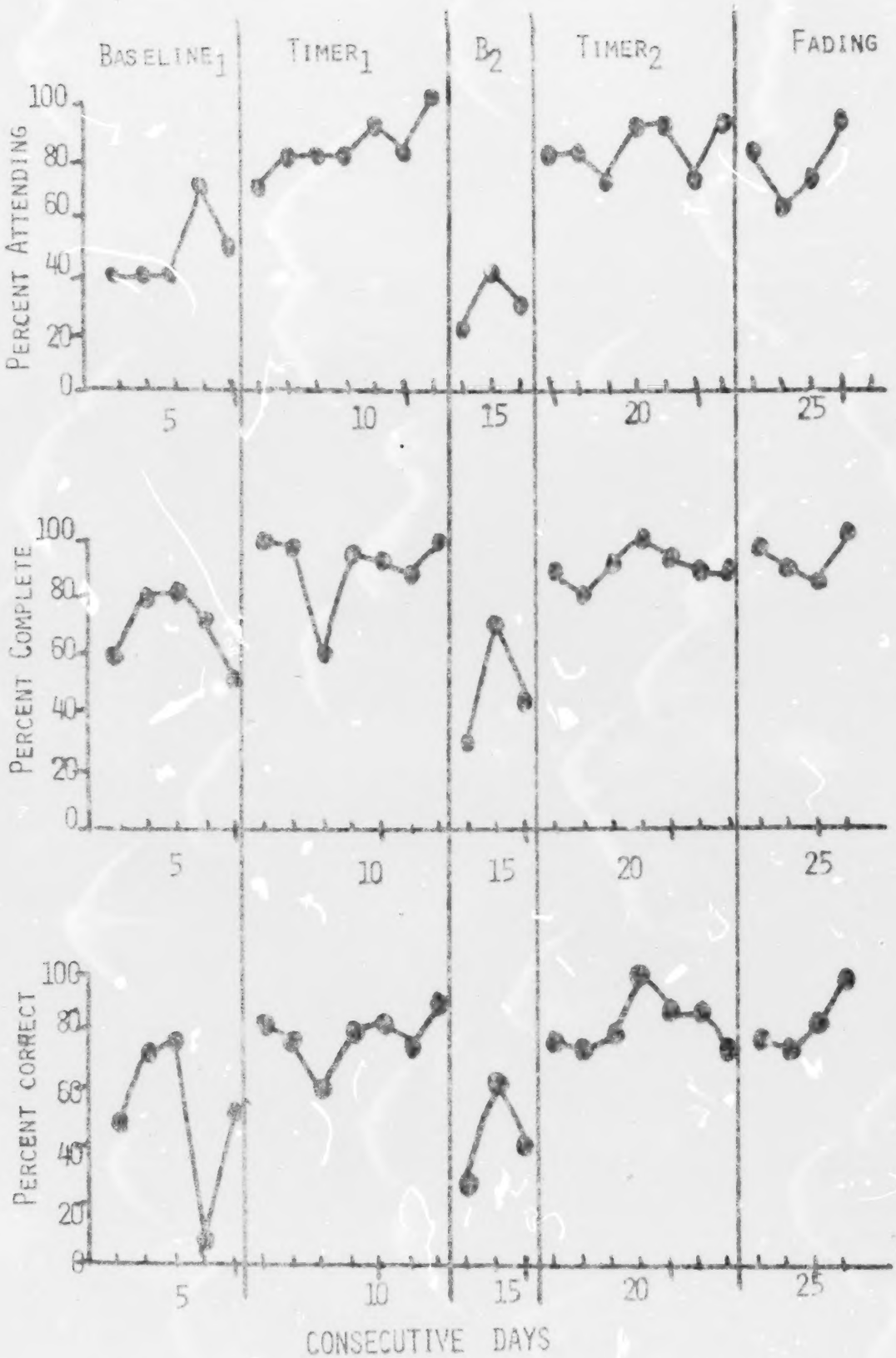

FIG. 1 THE TEACHER'S RECORD OF RONNIE'S ATTENDING BEHAVIOR (TOP), COMPLETION (MIDDLE), AND ACCURACY (BOTTOM) DURING EACH CONDITION.

Discussion

The results indicated that the introduction of the kitchen timer was effective in increasing the study behavior and concurrent completion and accuracy of assignments. When the timer was withdrawn, there was an immediate return to baseline levels. The re-introduction of the timer again increased the occurence of attending behavior and raised the completion and accuracy percentages. When the timer was gradually faded, these behaviors maintained indicated that the teacher was able to program for generalization. The use of the timer as an antecedent stimuli produced excellent results for this pupil. The teacher was able to carry out the procedure while attending to 21 other students. Further research in the use of such antecedents may provide the regular classroom teacher with valuable procedures for improving study behaviors and academic output for deficit students. Thus the teacher who arranges the three components of teaching suggested by Skinner, 1968, (antecedents, behaviors, and consequences), can follow a research approach to analyze which is the best possible arrangement to produce the best possible learning.

The timer was paired with teacher instructions which are important stimuli for occasioning academic responses (Lovitt and Smith, 1972). It should be noted that the regular classroom consequences of a change in activities were also available. Apparently those activities were sufficiently reinforcing to maintain continued completion and accuracy.

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Footnote

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Figure Caption

Figure 1. The teacher's record of Ronnie's attending (top graph) completion (middle graph), and accuracy (bottom graph) during each condition.